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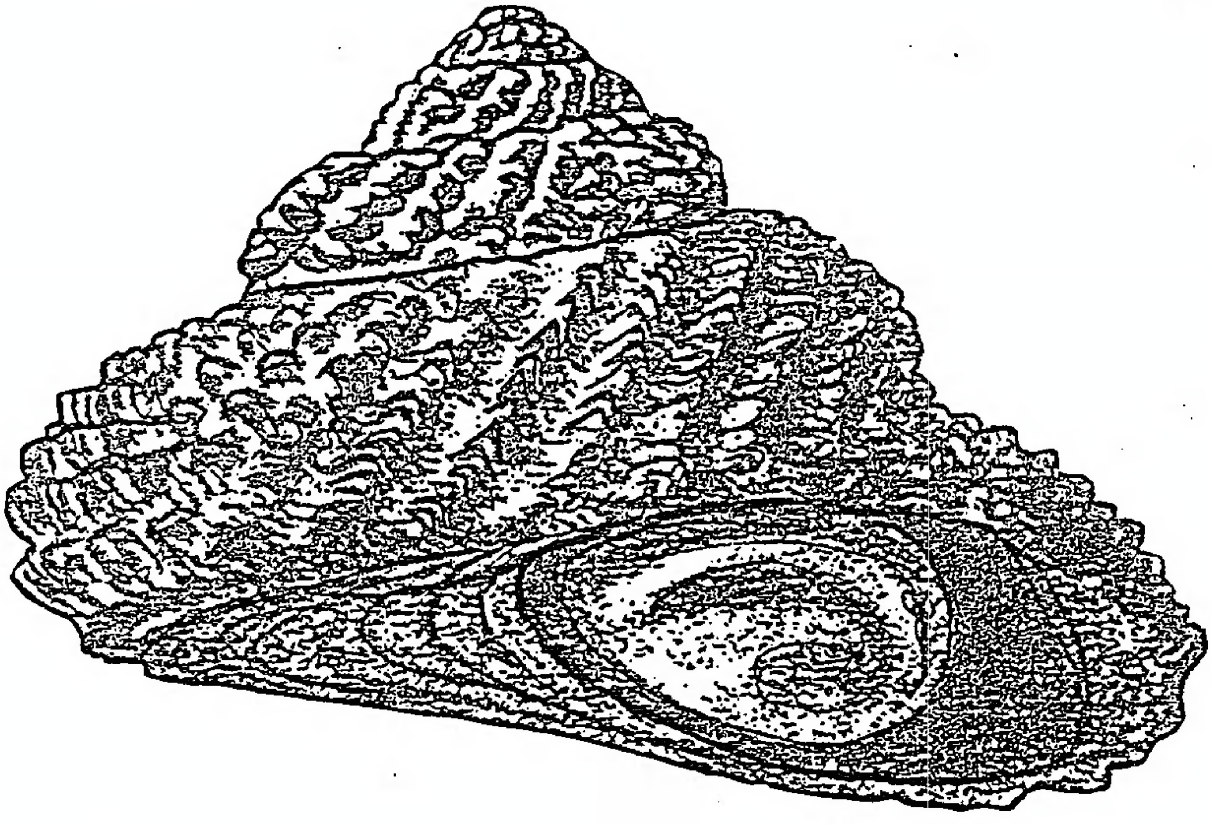

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SOUTHERN STEWART ISLAND MOLLUSCS & BRACHIOPODS

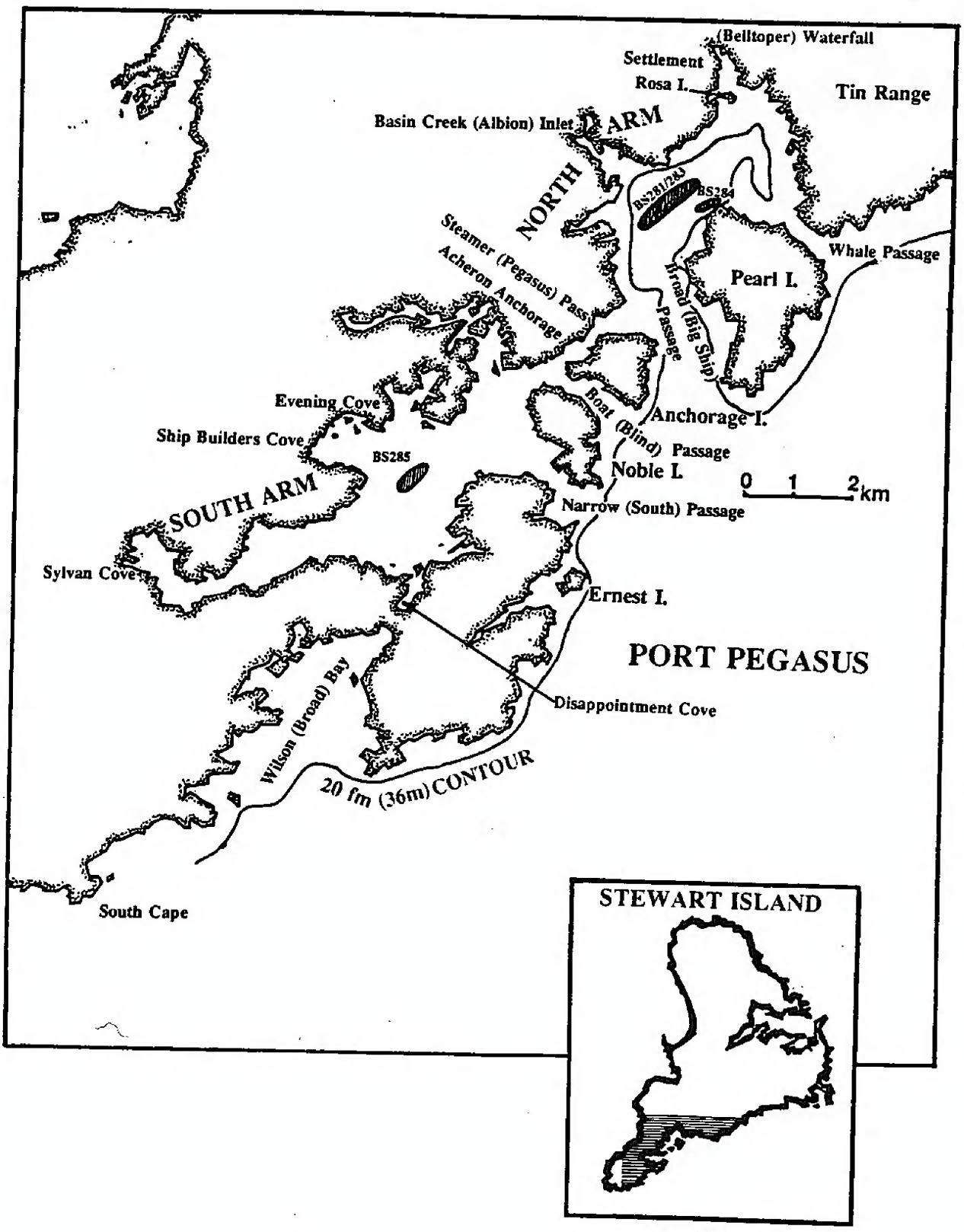

Fig. 1 - Port Pegasus and environs (20 fathom [36 metre] marine contour shown). The positions of the "dead *Neothyris*/live *Astraea*" stations BS 281, 283 and 285, as well as the "5 brachiopod" station BS 284, are indicated. Drawn by Anton van Helden based on NZMS 219, with 20 fathom contour from soundings on chart NZ 6842.

MARINE MOLLUSCS AND BRACHIOPODS TAKEN AT PORT PEGASUS AND SOME NEARBY LOCALITIES DURING THE 1972 DOMINION MUSEUM EXPEDITION TO SOUTHERN STEWART ISLAND

By John Yaldwyn and Frank Climo

Museum of New Zealand Te Papa Tongarewa

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PREAMBLE

In a recent article in *Cookia*, Jenny Raven (1992) described a visit to Port Pegasus, Stewart Island, and gave readers some idea of varied shoreline, the natural, almost undisturbed, feeling of this great southern harbour and some of the results of her shell collecting there. We felt this provided an opportunity for the two of us (JCY and FMC) to re-present here the Port Pegasus marine mollusc lists given station by station by Frank Climo in *Wellington Shell Club Bulletin* 30 in 1972 in a different, more useful, integrated checklist form.

In the lists given here we include marine molluscs and brachiopods taken both in Port Pegasus, and at localities outside Port Pegasus, during the 1972 Dominion Museum southern Stewart Island expedition that Frank was reporting on. We put the mollusc list in the order used by Powell in his *New Zealand Mollusca* (1979) and the brachiopod list in the order used by Elliot Dawson in his recent lists of the living brachiopods of New Zealand (1990, 1992). We indicate at each entry the southern Stewart Island localities and bottom types from which the mollusc and brachiopod species were taken in 1972. We also provide a little background information on the 1972 Dominion Museum expedition to southern Stewart Island, on its personnel, its organisation, its objectives and results, concentrating on the marine biological aspects of the work carried out by the expedition team.

Special coverage is given to the dead *Neothyris* brachiopod, muddy bottom found in Port

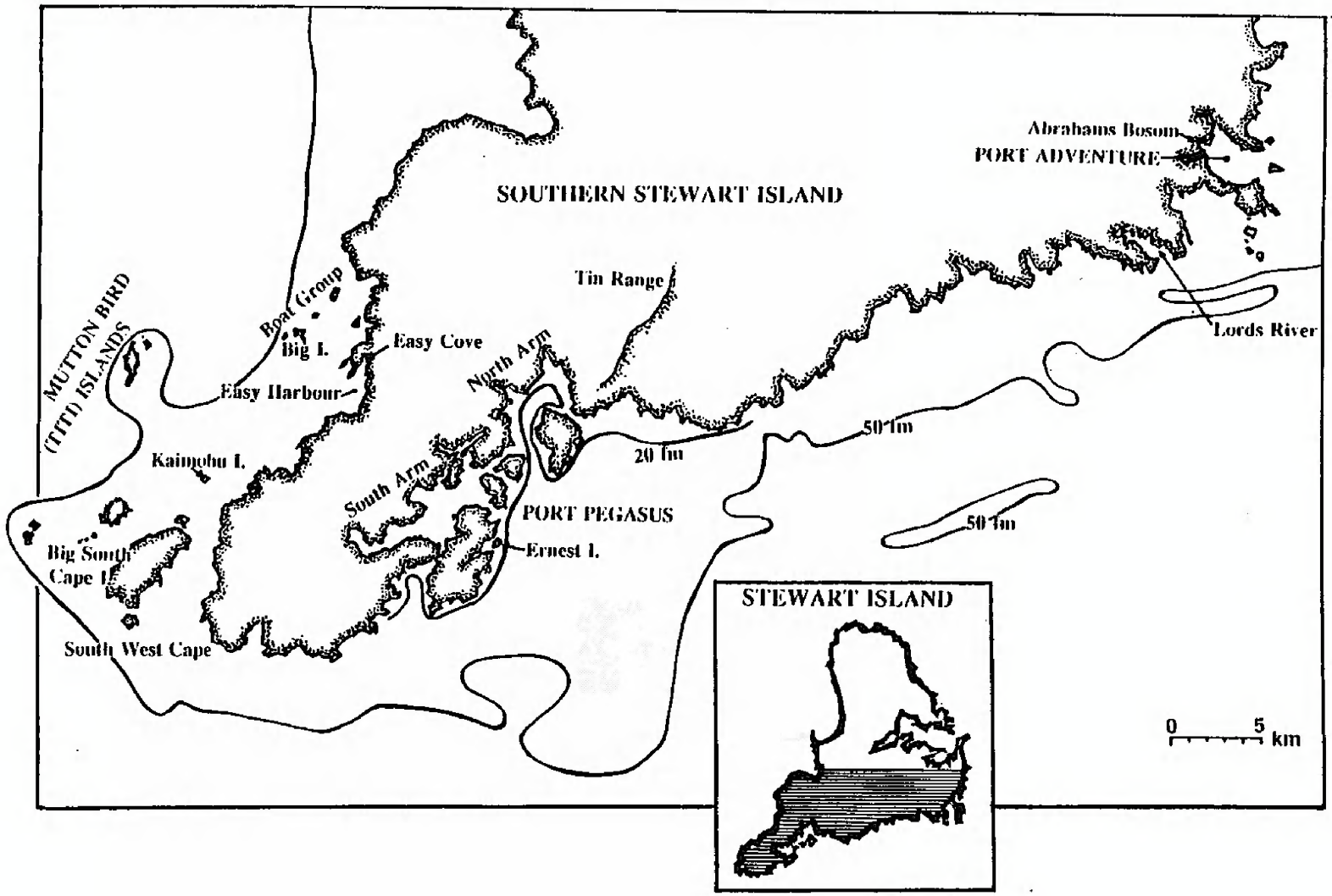

Fig. 2 - Southern Stewart Island from Easy Harbour to Port Adventure (20 and 50 fathom [36 and 91 metre] contours shown). Drawn by Anton van Helden based on NZMS 18.

Pegasus between about 30 and 50 metres. This is the so-called "Port Pegasus 5 brachiopod bottom" mentioned by Joyce Richardson in her summary of the "Brachiopods of Stewart Island" published in *Cookia* in 1979. A future contribution by Yaldwyn and Richardson in *Cookia* will deal in more detail with this remarkable death assemblage of the brachiopod *Neothyris lenticularis* on the muddy bottom of Port Pegasus.

THE 1972 SOUTHERN STEWART ISLAND EXPEDITION

In February-March 1972, the Dominion Museum (known as the National Museum of New Zealand from 1973 to 1992, now the Museum of New Zealand Te Papa Tongarewa) sent a team of marine and terrestrial biologists to southern Stewart Island in Alex Black's 23 m R.V. *Acheron*. The aim was to build up the Museum's collections of marine invertebrates, fish, algae, and terrestrial plants and invertebrates from southern Stewart Island, as well as to obtain additional information on Stewart Island marine and terrestrial ecology, and on the distribution and status of Stewart Island birds, especially seabirds.

PERSONNEL

The expedition team consisted of the Museum's then Curators of Molluscs (Dr Frank Climo), Crustacea (Dr John Yaldwyn), Fishes (John Moreland), Insects (Ron Ordish), Botany (the late Bruce Hamlin), the Museum's then specialist on marine algae (Nancy Adams) and Assistant Entomologist (Logan Hudson). The late Dr (later Sir Charles) Fleming, then Chief Palaeontologist of the NZ Geological Survey and Chairman of the Museum Management Committee, and Gordon Greig of the then Department of Lands & Survey were also members of the expedition team. In addition to their general curatorial responsibilities, members of the team had the following special responsibilities: Hamlin - bryophytes, Climo - land snails, Moreland - diving and underwater fish poison stations, Fleming - cicada sound recording, Fleming and Yaldwyn - birds. Frank Climo led the land party ashore at Port Pegasus and John Yaldwyn the marine party on *Acheron*. Alex Black, Ross McFadgen, Ian Payton and the *Acheron's* builder Brian Inglis were captain and crew of R.V. *Acheron* respectively.

OBJECTIVES

The expedition had 6 main objectives:

1)- land a party at the old settlement site at the head of North Arm, Port Pegasus, to make collections of terrestrial and marine, animal and plant life in the northern Port Pegasus - southern Tin Range area;

2)- work a series of marine bottom stations in Port Pegasus and other inshore parts of southern Stewart Island to build up representative collections of benthic invertebrates and fish from the area;

3)- work a series of shelf and deeper water bottom stations off southern Stewart Island as opportunities permitted;

4)- land and spend a night on several of the muttonbird islands off southern Stewart Island (especially Big South Cape Island) to make general biological collections, and collect limited samples of breeding petrels, especially the Mottled Petrel (*Pterodroma inexpectata*);

5)- land and spend a night on one or both of the isolated Solander Islands, midway between the west coast of Stewart Island and Puysegur Point, South Westland; and

6)- collect limited samples of certain characteristic Stewart Island birds, especially the Stewart Island Shag (*Leucocarbo chalconotus*) both pied and bronze phases, the Blue Shag (*Stictocarbo punctatus steadi*), the black phase of the Variable Oystercatcher (*Haematopus unicolor*), and the New Zealand race of the Antarctic Tern (*Sterna vittata bethunei*).

The expedition had the permits and approvals then required to land and do biological investigations in the reserves and other areas it intended to visit.

The areas at that time included:

1) The Pegasus Scenic Reserve surrounding Port Pegasus except for a small area excluded from the Reserve around the old settlement site at the head of North Arm.

2) The Reserve for the Preservation of Flora and Fauna in Pegasus and South Cape Survey District in which the Tin Range and the southwestern coastline of Stewart Island is situated. The area around Easy Harbour on the southwest coast is excluded from this reserve.

3) The Fiordland National Park in which the Solander Islands are situated.

4) The "beneficially owned" muttonbird islands off southern Stewart Island. Working under general arrangements made by the then Wildlife Branch of Internal Affairs, general approval from the Commissioner of Crown Lands was required to land on the islands and then special permission from the specific owners concerned was needed to use facilities on the islands. The Chairman of the Muttonbirders' Committee, Invercargill, was contacted to obtain permission from individual owners.

5) The old house at the settlement site at the head of North Arm, Port Pegasus, was used as the base for the land party with the approval of the private owner.

SUMMARY OF RESULTS

The expedition sailed from Port Chalmers on *Acheron*, 17 February and returned on 4 March 1972. The land party was ashore, based at the old settlement site, North Arm, Port Pegasus, from 19 February to 2 March. They made extensive terrestrial and marine biological collections in the northern Port Pegasus area and on the southern spur of the Tin Range.

A series of bottom stations were made from *Acheron* by the marine party with dredge and trawl in Port Pegasus (BS 273-278, 281, 283-286) in 7 to 50 metres, off Port Pegasus (BS 279) in 120 m, in Wilson Bay south of Port Pegasus (BS 280) in 31 m, in Easy Harbour on the west coast of southern Stewart Island (BS 282) in 7-20 m, off Easy Harbour (BS 288) in 93 m, in Port Adventure east coast of Stewart Island (BS 290) in 16-18 m. Shore and intertidal collections were made by expedition members at North Arm, Disappointment Cove and Evening Cove, all in Port Pegasus, and inside the northern entrance to Port Pegasus, on Ernest Island off Port Pegasus, at Easy Harbour, and at Abraham's Bosom in Port Adventure. Two diving and underwater fish poison stations (BS 287, 289) were made in Port Pegasus, and a fresh-water fish poison collection made in the settlement stream, North Arm, Port Pegasus.

Parties were put ashore overnight on two muttonbird islands - Big South Cape Island, off Southwest Cape, and Ernest Island, just south of Port Pegasus, and a day was spent with a Wildlife Branch team working on the Saddleback recovery programme on Big Island in the Boat Group off Easy Harbour and on Kaimohu in the Titi Islands.. Representatives of all breeding

petrels were collected for the Museum in coordination with the Wildlife Branch programme. Strong westerly winds and rough seas prevented any visit to, on landing on, the Solander Islands.

Limited representative samples were collected for the Museum of both pied and bronze phases of the Stewart Island Shag, the Blue Shag and the black phase of the Variable Oystercatcher. Antarctic Terns were seen in two localities but no specimens were taken.

Following the return of the expedition, Frank Climo (1972) published the Port Pegasus mollusc lists station by station, and Nancy Adams, with co-authors Conway, Norris and Willa (1974), published an annotated checklist of the marine algae of Stewart Island including the collections made in Port Pegasus and southern Stewart Island in 1972. An unpublished 32 page *Report on the Dominion Museum southern Stewart Island expedition 17th February to 4th March 1972* by John Yaldwyn and an unpublished 15 page report on the *Dominion Museum southern Stewart Island Acheron expedition bird observations - February 17 to March 3, 1972* by Charles Fleming are in the Museum's archives.

NOTES ON THE HISTORY, CHARTS & MAPS OF PORT PEGASUS

Robert McNab in his two important works on pre-Treaty of Waitangi history of southern New Zealand, *Murihiku* (1907) and *Old Whaling Days* (1913) covers the European discovery, naming, and early settlement of Port Pegasus, also known in those early days as Pegasus Harbour, South Port and Southern Port. Two additional books cover other aspects of the discovery and history of the area and have been used with the two McNabs, and the other works listed below, in the preparation of these outline notes. These two are *This Stern Coast* by Rear Admiral John Ross (1969), which covers the story of the charting of the New Zealand coastline, and *Rakiura* by Basil Howard (1940), which is the NZ Centennial history of Stewart Island. Howard's book is a very readable, mine of information, on all aspects of the European discovery and settlement of Stewart Island.

The earliest known European visit to Port Pegasus was in 1804 when the American Owen F. Smith, probably from the sealing schooner *Independence* out of Sydney, produced a crude chart of the east coast of Stewart Island showing Port Pegasus, which he named Port South, and under different names Lord's River, Port Adventure and Paterson Inlet. Smith gave this chart to Captain King, Governor of New South Wales, in 1806 and it remained unknown and unavailable in New South Wales government archives until 1931 when copies were sent to New Zealand. Both Ross and Howard reproduce Smith's chart.

The *Pegasus*, Captain Chase, out of Sydney with William W. Stewart (after whom Stewart Island was named) as first officer, entered and named Port Pegasus on 7 August 1809. Stewart drew a good chart of Port Pegasus which was published in 1816. Chase and Stewart described Stewart Island as then uninhabited (presumably by Maori). Once again both Ross and Howard reproduce Stewart's chart.

The *Snapper*, Captain Edwardson, from Sydney entered Port Pegasus in November 1822 looking for flax and took aboard 12 men from the American ship *General Gates* who had been left ashore 17 months before to hunt seals. They had been hiding from Maori groups for about 8 months and 3 of their party had been killed and eaten during this period. The *General Gates* came into Port Pegasus while the *Snapper* was there and picked up the survivors from her shore party.

William Stewart returned to Port Pegasus in the schooner *Prince of Denmark* in 1826 to establish a timber and shipbuilding yard bringing a team of men under William (sometimes

known as George) Cook from the Bay of Islands. The yard is thought by some to have been established at Shipbuilders Cove, opposite Narrow (South) Passage (and hence the reason for the name) but logic and local knowledge would indicate that it was more likely to have been in North Arm, probably at the later settlement site. Some days before Stewart reached Port Pegasus in 1826, the ships of the (first) New Zealand Company, *Rosanna* Capt. Herd, and *Lambton* Capt. Barnett, arrived at Port Pegasus with immigrants for the Company's intended settlements at Hokianga and Thames. They had called in at Port Pegasus to prepare their firearms and ships' guns before arriving at their intended destination! Captain Herd resurveyed parts of Port Pegasus working with Stewart to correct positional inaccuracies in Stewart's published 1816 chart. Parties of sealers and Maori from the Foveaux Strait area were living in several of the bays at this time. Herd described Port Pegasus as being able to "contain the whole Navy of Great Britain secure from all winds" but found the freshwater was "not very good - - - it had a reddish tinge, and imparted that colour to everything it touched, and was very astringent, which we thought was caused by the decayed vegetables it ran through. This is the most rainy and boisterous part of the world I was ever in." The settlers of this (the first) New Zealand Company were not received well in the north (in spite of, or because of their guns?) and soon moved on to Sydney.

George Cook and his shipbuilding team were abandoned by Stewart but built the 60 ton schooner *Joseph Weller* at Port Pegasus between 1829 and 1833 for George Weller of Sydney, proprietor of the whaling stations at Preservation Inlet and Otago. The *Joseph Weller* was the first ship recorded as built on Stewart Island. She was wrecked at Newcastle, New South Wales, in 1837. Captain Benjamin Morrell of the American Schooner *Antarctic* visited George Cook and his men at Port Pegasus in September 1830, and saw the *Joseph Weller* under construction.

Captain Nias of HMS *Herald* declared British sovereignty over Stewart Island in South Arm, Port Pegasus in June 1840 and used Stewart's chart of the area. There was no sign of Maori occupation and thus no one available to sign the copy of the Treaty of Waitangi that the *Herald* was carrying around the South Island for signature.

The Admiralty chart of *Port Pegasus* (BA 2542), captioned "Surveyed by Capt. J.L. Stokes and the officers of H.M.S. *Acheron* 1849", was first published in 1857, and reissued several times with minor corrections to 1956. It was reprinted unaltered, but in colour, by the Hydrographic Offices Royal New Zealand Navy as NZ 6842 in 1978. The 1849 survey date in the chart's caption is a bit of a surprise as Sheila Natusch in her lively, well illustrated book on the *Cruise of the Acheron* (1978) describes HMS *Acheron* visits to Port Pegasus only in May 1850, and late December 1850 or early January 1851 (the *Acheron's* New Zealand survey lasted from late 1848 to mid 1851). Surveying parties from the *Acheron* moved all round New Zealand in a series of smaller vessels during this period but there is no evidence (Sheila Natusch pers. com.) that they were anywhere near Port Pegaus in 1849. As *Acheron's* Port Adventure chart printed on the same sheet as Port Pegasus is dated 1850, the 1849 Port Pegasus date is possibly just an engraving error made at some time before publication in 1857. Natusch publishes a sketch of Belltopper waterfall in North Arm by the *Acheron's* master F.J. Evans, and notes that the *Acheron* survey found nobody then living in the Port Pegasus area. George Cook's shipbuilding site was deserted and silent.

Gold was discovered in Pegasus Creek, North Arm, in 1881 and tin in some quantity in the same creek bed in 1888. By the end of December 1888, 44 tin prospecting licences had been issued for the Pegasus Creek/Tin Range area. By early 1889 more than 200 miners were in the area, and a store and post office had opened. A licensed accommodation hotel was opened at the settlement site in mid 1889. By the end of that year, more than a hundred claims had been taken up, but few were being worked, though some tunnels had been driven into the Tin Range with the intention of intercepting the expected mother tin lode. Sluicing for tin and gold proved different and

unrewarding, most miners left the area and the post office finally closed in 1893. Sporadic panning for gold and stream tin by individual miners continued, in association with fishing, until about 1914. Following a sharp rise in the price of tin in 1912, a Dunedin mining company built a jetty at the settlement site and a tramway 3 miles onto the Tin Range but returns from tin and gold were too slight to cover costs of further development and the project was abandoned.

A fish refrigeration plant was built at the North Arm settlement in 1897 by Williamson and Nevill of Bluff. In 1903 the Port Pegasus Fishing Company was formed and shipped fish from North Arm until it closed in 1914 due to wartime labour shortages. The freezer was taken over by the Pegasus Fresh Fish Company in 1915, was overwhelmed by a landslide, then rebuilt nearer the waterfall at the head of North Arm. The freezer and the electric light system of the settlement was powered by Pegasus Creek, and freezer and settlement were connected by phone!

Sheila Natusch in her book *Roy Traill of Stewart Island* (1991) records how Roy Traill (Sheila's father) spent 4 months in Port Pegasus in the early 1920s, living in the old hotel, the so-called "Big House", at the settlement, fishing for blue cod. Tin and gold mining were long over, but the jetty and tramline were still in place. Natusch publishes undated photos of the settlement jetty (no longer in existence), settlement houses, a large quay-side shed, and the foundations of the "Big House".

Major Wilson in his book *Bird Islands of New Zealand* (1959) gives a lot of anecdotal information on the Muttonbird Islands (a specific group, not muttonbird islands in general) off southwest Stewart Islands (Big South Cape, Solomon and their neighbours) and photographs of the building of the 20 m ketch *Ranui* (late of Cape Expedition fame) at Port Pegasus. *Ranui* was built by Captain Larsen, from the Rosshavet (Ross Sea) Whaling Company's base in Paterson Inlet, in the big quay-side shed at the North Arm settlement between 1926 and 1935. She was built for J.W. Thomson to take blue cod from his Port Pegasus freezer to Bluff, from there to be exported to Australia. A "slump in the fishing industry" caused the long delay in finishing *Ranui*. Surprisingly "Port Pegasus" does not appear in Wilson's index but *Ranui* does. The remains of the Thomson's concrete fish freezer was clearly visible on the shoreline quay when we landed at the settlement site in 1972.

The story of the Rosshavet Whaling Company and the Norwegian whaling base, the "Kaipipi Shipyard", in Paterson Inlet (1924-1933) is given in great detail in James Watt's fully illustrated book (1989). There the *Ranui's* shipbuilder is named as Korinius Larsen (p.56, not 57 as given in the index).

The history and use of the beneficially owned muttonbird islands off southern Stewart Island is covered in detail by Eva Wilson in her book on the *Titi Heritage* (1979).

Lands & Survey maps of southern Stewart Island include the NZ Topographic Map 1 : 250,000 series, NZMS 18, with *Stewart Island* on sheet 26 published in 1971. This is a doubly useful map as it also has the 10, 20 and 50 fathom marine contours marked. The *Map of Stewart Island* at 1 : 126,720, NZMS 219, 3rd Edition 1975 is very useful and has scenic, nature and other reserve boundaries marked. The southeastern part of this map was used in *Cookia* to illustrate Jenny Raven's 1992 article on shell collecting in Port Pegasus. The old standard NZMS 1, the "1 inch to 1 mile" series at 1 : 63,360 did not cover Stewart Island at all, but the large scale NZ Topographic 1 : 50,000 series, NZMS 260 covers Port Pegasus and the Muttonbird Island group in two sheets *Mt Allen* (D49) and *South Cape* (C50/D50), both published in 1981.

THE MARINE COLLECTIONS OF THE 1972 EXPEDITION

The following is an outline account of the localities and stations where marine collections were made by the 1972 Dominion Museum expedition, with a summary of the general environment at each locality, and notes on some of the significant and/or interesting animals and plants present. Abbreviations in brackets after each locality, or grouping of bottom stations, are those used in the mollusc and brachiopod checklists, which follow this general account of the marine collections, and indicate where each species was taken during the expedition. The initials FMC and JCY indicate that the collections and original descriptive observations were made by Frank Climo and John Yaldwyn respectively. All summary remarks on both numbered (BS sequence) and unnumbered bottom stations were originally made by JCY. Observations and identifications on the diving and fish poison stations were originally made by John Moreland.

Place names in the Port Pegasus area follow the Admiralty chart (BA 2542 *Port Pegasus*, reprinted as NZ 6842) with, where necessary, alternative names from more recent Lands & Survey maps (NZMS 18 and 219) given in brackets.

SHORE COLLECTIONS

North Arm, Port Pegasus, between settlement & (Belltopper) waterfall, FMC, 19-29 Feb. 1972 (PPNA) - water crystal clear, live oysters *Ostrea lutaria* free-living on sediment intertidally; huge *Paphies australis* in abundance; *Marinula filholi* sparingly under rocks; *Leuconopsis obsoleta* quite common under rocks as are *Lasaea* and a small *Estea*, a wide range of *Buccinulum littorinoides*, and a large pallid *Buccinulum*, *B. pertinax*, relatively common in a small muddy bay living with, and hard to distinguish in the field from, *Cominella nassoides*, 2 species of *Siphonaria*, *S. zelandica* rather loosely fitting onto rock and ranging from high intertidal down to the orange *Lithothamnion* zone, with foot light coloured (yellow-grey to orange) distinctly flecked with brown, and large *S. cookiana* rather rare, tightly fastened to rock and living in intertidal crevices, central part of foot light yellowish grey with the pallial rim black; at extreme low water spring tide the following molluscs were on the sandflats: *Ostrea*, *Chione stutchburyi*, *Paphies*, *Venerupis largillierti*, *Tawera spissa* and the predators *Buccinulum pertinax*, *Cominella*, and *Xymene ambiguus*.

Mainland inside Whale Passage (the northern entrance to) Port Pegasus, FMC, 21 Feb. 1972 (PPNE) - collections from intertidal rocky shore; the smooth red *Waltonia inconspicua* brachiopod community (of all sizes from the very small upwards) attached under rocks; shell sand samples taken.

Head of Disappointment Cove, South Arm, Port Pegasus, Hamlin & JCY, 26 Feb. 1972 (PPDC) - incidental shell collection made while collecting bryophytes.

Eastern shore of Evening Cove, South Arm, Port Pegasus, Adams, Fleming & JCY, 27 Feb. 1972 (PPEC) - incidental shell collection made while collecting intertidal algae.

Ernest Island, just south of and outside Narrow (South) Passage, the southern entrance of Port Pegasus, FMC, 1 March 1972 (EI) - *Comptella curta* alive under rocks; same smooth red *Waltonia* brachiopod community under rocks as at Whale Passage; *Gadinalea conica* and *Borniola decapitata* present here and at Whale Passage.

Easy Cove and "back beach", Easy Harbour, southwest coast Stewart Island, JCY, 23 Feb. 1972 (EH) - Easy Cove is a sandy beach, but "back beach" over the headland north from Easy Cove is a rocky shore; collected series of limpets and barnacles; mid tidal, rocky shore

decapod crustaceans seen were the common active little alpheid shrimp *Betaeopsis aequimanus* (mainly the dark colour form with the longitudinal white dorsal stripe), especially large examples of the half crab *Petrolisthes elongatus*, the big-handed crab *Heterozius rotundifrons* (the only true crab seen intertidally), and pinkish-yellow *Upogebia* mud shrimps from deep burrows in sand between and under boulders in mid tidal pools.

Abraham's Bosom, Port Adventure, east coast Stewart Island, south of Paterson Inlet, FMC & JCY, 3 March 1972 (PA) - sandy beach and intertidal rocky shore; on sandy beach *Paphies australis* and *Chione*, as well as a claw of the pink burrowing sand shrimp *Callianassa filholi*, broken carapaces and claws of the swimming crab *Ovalipes catharus* and of *Notomithrax* spider crabs; on rocky shore the only decapods seen were *Petrolisthes* and *Heterozius*.

PORT PEGASUS SHALLOW WATER (7-11 m) STATIONS

MAORICOLPUS MUD BOTTOM (PP *Maoricolpus* bottom)

BS 273, anchorage off settlement site, head of North Arm, Port Pegasus, 11 m, 20 Feb. 1972, bottom sample from anchor, foul smelling mud and dead shell including *Maoricolpus roseus*.

BS 274, Sylvan Cove, South Arm, Port Pegasus, 7 m, 20 Feb. 1972, dredge haul, mud with mass of dead thin clean purple *Chlamys* shell, with some *Maoricolpus* and live *Struthiolaria papulosa*.

PORT PEGASUS 14-50 m STATIONS

MIXED BOTTOMS (PP mixed bottoms)

BS 275, Sylvan Cove, South Arm, Port Pegasus, 14 m, 20 Feb. 1972, dredge haul, mixed shell and holothurians.

BS 276, Sylvan Cove, South Arm, Port Pegasus, 18-22 m, 20 Feb. 1972, dredge haul, mud with free-living worms of several groups.

BS 277, between Shipbuilders Cove and Narrow (South) Passage, South Arm, Port Pegasus, 23-28 m, 20 Feb. 1972, beam trawl, much algae and numerous large solitary unattached calcareous *Protula biserialis* worm tubes, *Astraea heliotropium*, large sea urchins *Evechinus chloroticus*, and the large brittlestar *Pectinura maculata*.

BS 278, Acheron Anchorage and Steamer (Pegasus) Passage, Port Pegasus, 18-20 m, 20 Feb. 1972, 2 beam trawls, algae, *Astraea*, hermit crabs and small brittlestars.

BS 284, North Arm, Port Pegasus, near shoreline of Pearl Island, 45-50 m, 26 Feb. 2 otter trawls on mud and broken granite rock bottom with bryozoa clumps, calcified worm tubes, and numerous specimens of the 3 small brachiopods (the smooth red *Waltonia*, the ribbed red *Terebratella sanguinea*, and the ribbed black *Notosaria nigricans*) attached to hard bottom pieces. Live white *Liothyrella neozelanica* and dead pink *Neothyris lenticularis* brachiopods also present (hence a 5 brachiopod bottom).

BS 286, Acheron Anchorage and Steamer (Pegasus) Pass, Port Pegasus, 20 m, 27 Feb. 1972, beam trawl, mass of algae, several urchins *Evechinus*, brittlestars *Pectinura*, and holothurians *Stichopus*.

PORT PEGASUS 29-46 m STATIONS

DEAD *NEOTHYRIS*/LIVE *ASTRAEA* BOTTOM (PP *Neothyris* bottom)

BS 281, North Arm, Port Pegasus, 35-44 m, 22 Feb. 1972, beam and otter trawls along the muddy bottom of the North Arm channel. Note: the North Arm - Broad Passage (Big Ship Passage) channel reaches a depth of 50 m on mud between Pearl Island and Basin Creek inlet; in Broad Passage itself the channel bottom is sand. Apart from this channel, no other parts of Port Pegasus are deeper than about 33 m (at least from the soundings on the chart, and in the experience of the 1972 expedition, see also the 20 fm contour on NZMS 18 Stewart Island). The BS 281 trawl samples produced very large numbers of large dead pink brachiopods *Neothyris lenticularis*, and numerous, mostly live *Astraea heliotropium*. The dead, articulated *Neothyris* formed primarily undisturbed beds on the muddy bottom with the individual brachiopods lying in the "in life" position as could be clearly seen from the external growths on the exposed "upper" portion of the paired valves. Other obvious animals taken at this station were dead *Struthiolaria*, *Poirieria zealandica*, *Dentalium suteri* (the type locality of which is Port Pegasus), large blue irregular urchins *Spatangus multituberculata*, the large brittlestar *Pectinura*, *Stichopus* holothurians, large *Protula* worm tubes, opal fish *Hemerocoetes*, and 2 species of triplefins. Two small live specimens of *Neothyris* were found with the mass of dead adult brachiopods, and small specimens of 3 other brachiopods were found attached to the underside of many of the live *Astraea* (the BS 284 combination *Waltonia*, *Terebratella* and *Notosaria*). A large sample of dead *Neothyris* from this station was retained for future morphometrical study.

BS 283, North Arm, Port Pegasus, 40-46 m, 25 Feb. 1972, 2 otter trawls along the North Arm channel mud bottom. Very much the same hauls as BS 281, dominated by very large numbers of large dead *Neothyris* brachiopods and numerous live *Astraea*. Species obviously additional to the BS 281 list include *Zeatrophon pumilus*, *Dentalium zelandicum*, and a 5th species of brachiopod - a fresh specimen of the large white *Liothyrella neozelanica*. Among the great mass of large dead *Neothyris* was a single large, and some small, living *N. lenticularis*.

BS 285, off Shipbuilders Cove, South Arm, Port Pegasus, 29-31 m, 26 Feb. 1972, 2 otter trawls on the muddy bottom of the shallow internal basin in the widest part of South Arm. The South Arm, 31 m basin is separated from its nearest access to the open sea, through Narrow (South) Passage, by a sill at about 25 m, and from the North Arm channel by the even shallower (minimum depth about 16 m), narrow Acheron Anchorage - Pegasus Pass inside Noble and Anchorage Islands. Very similar to the BS 281/283 dead *Neothyris*/live *Astraea* bottom, with in addition very numerous clumps of dead *Modiolarca impacta* within their own "nests" of byssus threads. Also present were live *Struthiolaria*, the pale irregular urchin *Echinocardium cordatum*, *Pontophilus* sand shrimps, sucker fish and *Hippolyte* weed shrimps from algae, and a triplefin. Among the man of dead *Neothyris* were 2 large live *N. lenticularis*.

WILSON BAY 29-31 m STATION

HARD SANDY BOTTOM

BS 280, Wilson Bay (Broad Bay), south of Port Pegasus, 29-31 m, 21 Feb. 1972, series of dredge hauls on hard sandy bottom, with small brown irregular urchins *Apatopygus recens* (which have the startling habit of turning green immediately on being put in alcohol) and black *Notosaria* brachiopods.

EASY HARBOUR 7-27 m STATIONS

SANDY BOTTOM (EH sandy bottom)

BS 282, Easy Harbour, southwestern coast Stewart Island, 7-20 m, 24 Feb. 1972, series of dredge hauls, beam and otter trawls up and down harbour on a sand and algal bottom, with *Maoricolpus* at shallow depths, 2 species of *Cominella* (*nassoides* and *otagoensis*), *Tawera spissa* common, *Pontophilus* sand shrimps, and the uncommon little swimming crab *Liocarcinus corrugatus.*

Scour channel, entrance to Easy Harbour, 27 m, 24 Feb. 1972, dredge haul, dead shell (*Tawera* and *Scalpomactra*) on sand bottom.

PORT ADVENTURE 16-18 m STATION

BRYOZOA BOTTOM (PA bryozoa bottom)

BS 290, Port Adventure, east coast Stewart Island, 16-18 m, 3 March 1972, 2 beam trawls between Abraham's Bosom and entrance, masses of brown and red algae, lamellate bryozoan blocks with attached *Waltonia* brachiopods, *Hippolyte* weed shrimps, *Periclimenes* palaemonid shrimp, *Notomithrax* spider crabs, and a rare clinid fish *Callogrammus flavescens.*

OFF EASY HARBOUR 93m

SANDY BOTTOM

BS 288, off Boat Group, west of Easy Harbour, southwestern Stewart Island, 93 m, 28 Feb. 1972, beam trawl on smooth sandy bottom, numerous spider crabs *Leptomithrax longipes*, opal fish *Hemerocoetes*, and triplefins.

SOUTH OF PORT PEGASUS 118 m

HARD BRYOZOA AND SHELL BOTTOM (bryozoa shelf)

BS 279, off Port Pegasus, about 16 km south of Whale Passage, 118 m, 21 Feb. 1972, beam trawl and dredge on coarse bryozoan and shell bottom with *Panopea smithae*, *Astraea*, hermit crabs, and the swimming crab *Nectocarcinus antarcticus.*

PORT PEGASUS FISH POISON STATIONS

BS 287, Evening Cove, South Arm, Port Pegasus, 27 Feb. 1972, diving and fish poison station along western shoreline down to about 6 m. Tumbled rock and algal face with numerous crevices and overhangs. Soft sediment bottom with a few large dead *Neothyris* brachiopods. Some living small red brachiopods on rocks as well as numerous worm tubes with reddish orange fans extending from opening, encrusting bryozoans, sponges and tunicates. *Stichopus* sea cucumbers present, and large brown algae *Ecklonia* and *Macrocystis*, some with fronds up to 4 m in length, but no *Durvillaea* bull kelp present. Fish fauna appeared to be an "upper harbour type of fauna", though station was in direct sight of Narrow (South) Passage and the open sea. Fishes seen were numerous large spotty *Notolabrus celidotus*, several large moki *Latridopsis ciliaris*, trumpeter, roughy *Paratrachichthys traillii*, and more than 50 crayfish *Jasus edwardsii*. Some of the fishes taken were several species of triplefin including *Gilloblennius*, rockfish *Acanthoclinus*, rock cod *Lotella*. No conger eels or clingfishes seen.

BS 289, northern shore Rosa Island, North Arm, Port Pegasus, 2 March 1972, diving and fish poison station along northern shoreline of the small island off settlement site down to

about 4.5 m. Tumbled rock dropping off to white sand with some dead oyster shell. Beds of brown algae *Macrocystis* and *Ecklonia*. Fishes seen were 4 species of wrasse, blue cod *Parapercis colias* over open bottom, moki, conger eels and numerous crayfish in rock crevices. The fishes taken were a miscellaneous assortment of weed dwelling species, rockfish, roughy, rock cod, 6 species of triplefins including *Gilloblennius* and *Notoclinus*, juvenile butterfish *Odax pullus*, and the red banded perch *Hypoplectrodes huntí*. No clingfishes seen.

Freshwater poison station, settlement stream, North Arm, Port Pegasus, 1 March 1972, 2 species of *Galaxias* (the kokopu *G. fasciatus* and the inanga *G. maculatus*), a bully, the 2 New Zealand freshwater eels (*Anguilla australis* and *A. dieffenbachii*), and a triplefin from where the stream entered the sea.

THE MOLLUSC CHECKLIST

The mollusc checklist which follows is based on Frank Climo's 1972 identifications listed in *Wellington Shell Club Bulletin* 30 covering the Port Pegasus North Arm and Whale Passage shore collections; the Port Pegasus bottom stations 273, 281 and 283; the Easy Harbour BS 282, and the Port Adventure BS 290. To these have been added Frank's 1972 identifications (not listed in *Bulletin* 30) of the Port Pegasus Disappointment Cove and Evening Cove shore collections; the Ernest Island, Easy Harbour and Port Adventure shore collections; the Port Pegasus bottom stations 274, 276, 277, 284, 285, and the bryozoa shelf station south of Port Pegasus BS 279. A few additional molluscs passed to us by fishermen during the 1972 expedition are also included in the checklist as indicated. No molluscs were sorted or identified from the Port Pegasus bottom stations 275, 278 and 286, from the Wilson Bay BS 280 or from the sandy shelf station off Easy harbour BS 288. All the above 1972 mollusc identifications are registered in the Museum of New Zealand Molluscan register system between M. 26113 and 27443, though not all the individual numbers in this series were allocated to southern Stewart Island material.

Also included in the following checklist are a series of identifications of small molluscs from the Port Pegasus dead *Neothyris* bottom station 281 made by Bruce Marshall at the National Museum in 1975. These are registered in a continuous series between M. 44758 and 44842. Some of Bruce's identifications were of the same species that had been identified by Frank, but species identified by Bruce additional to those listed by Frank, or from bottom types additional to those from which Frank had identified the species, are indicated in the checklist with an asterisk.

Altogether Frank and Bruce identified a total of 510 lots from the 1972 southern Stewart Island expedition to at least generic, but in most cases to specific level. The checklist does not list all 510 lots station by station under each species, as bottom stations have been grouped into bottom types as set out in the general account of the shore collections and bottom stations given above. All 229 different mollusc taxa identified to generic or specific level in 1972 and 1975 are listed here followed by abbreviations for the shore collection and/or bottom type where the taxon was taken. The abbreviations used have been listed in the general account of the shore collections and bottom stations.

It is important to realise that these identifications have not been revised since they were made by Frank and Bruce in 1972 and 1975 respectively. No attempt has been made to locate or check any of the specimen lots which are now dispersed in systematic order throughout the Museum's mollusc collections. Names used have been updated where necessary to conform with Powell's 1979 *New Zealand Mollusca* text, but no attempt has been made to check or confirm identifications that do not appear to match the geographical distribution ranges given by Powell

for the species indicated. Likewise no attempt has been made to modernise family, generic or specific names to conform with advances in our knowledge of the systematics of New Zealand molluscs since Powell's 1979 text. Page numbers given in the lefthand column refer to the page in Powell (1979) where the species named is written up.

The checklist includes only the marine molluscs collected by the 1972 southern Stewart Island expedition. It does not include land snails taken by Frank Climo or other members of the land party, except that a single land snail species, the rotadiscid *Rotadiscus smithae* (Dell), was found as a dead shell in the Easy Harbour, shallow water, sandy bottom station 282 and is in the checklist. It was presumably washed down into Easy Harbour from the surrounding hill slopes.

Those species in the checklist whose type localities were either Port Pegasus, some other locality in or off Stewart Island, or in Foveaux Strait have this information indicated. A total of 45 of the 204 marine mollusc taxa identified to species level have type localities on or around the shoreline of Stewart Island.

Marine Mollusca taken by the Dominion Museum 1972 southern Stewart Island expedition:

AMPHINEURA

Ischnochitonidae

22 *Ischnochiton* sp. - PPNA, PPNE, EI.

Mopaliidae

26 *Maorichiton caelatus* (Reeve) - PPNE.

Chitonidae

27 *Amaurochiton glaucus* (Gray) - PPNA.

28 *Sypharochiton pelliserpentis* (Q. & G.) - PPNA, PPNE, PPEC, EI.

29 *Onithochiton neglectus neglectus* Rochebrune - PPNE, EI.

Onithochiton neglectus opiniosus Iredale & Hull - PPNE, EI.

Onithochiton sp. - PPNA.

Acanthochitonidae

30 *Acanthochitona zelandica* (Q. & G.) - PPNA, PPNE, EI.

Notoplax sp. - PP *Neothyris* bottom.

GASTROPODA

Scissurellidae

35 *Sinezona levigata* (Iredale) - PPNE, EH sandy bottom.

Scissurona rosea (Hedley) - EA sandy bottom, PA bryozoa bottom.

Haliotidae

37 *Haliotis* (*Sulculus*) *australis* Gmelin - PPNE.

Fissurellidae

38 *Incisura lytteltonensis* (E.A. Smith) - PPNE, PA bryozoa bottom.

Emarginula striatula Q. & G. - PP *Maoricolpus* bottom, PP *Neothyris* bottom.

41 *Monodilepas monilifera monilifera* (Hutton) - PP *Maoricolpus* bottom (type locality Stewart Id).

Patellidae

43 *Cellana ornata* (Dillwyn) - PPNA, PPNE, EH.

Cellana radians (Gmelin) - PPNE, EI.

44 *Cellana strigilis* (H. & J.) - PPNA, PPNE, EI, EH.

Acmaeidae

45 *Radiacmea inconspicua* (Gray) - PP *Maoricolpus* bottom.

46 *Patelloida corticata* (Hutton) - PPNA, PPNE, EI.

47 *Asteracmea suteri* (Iredale) - EH sandy bottom (type locality Port Pegasus).

48 *Notoacmea* (*Parvacmea*) *helmsi* (E.A. Smith) - PPNE, EI.

Notoacmea (*Conacmea*) *parviconoidea* (Suter) - PPNA, PPNE.

Notoacmea sp. - PPNA.

49 *Atalacmea fragilis* (Sowerby) - PPNA.

Trochidae

51 *Margarella antipoda rosea* (Hutton) - PPNE (type locality Stewart Id).

53 *Melagraphia aethiops* (Gmelin) - PPNA, PPNE, EI.

Diloma (*Diloma*) *arida* (Finlay) - PPNA.

Diloma (*Fractarmilla*) zelandica (Q. & G.) - PPNA.

54 * *Cantharidus* (*Cantharidus*) *opalus* (Martyn) - pp *Neothyris* bottom.

55 *Cantharidus* (*Cantharidus*) *purpureus* (Gmelin) - PP *Neothyris* bottom.

56 *Micrelenchus dilatatus* (Sowerby) - PA bryozoa bottom.

57 *Micrelenchus sanguineus* (Gray) - PPNE.

Micrelenchus sp. - PP *Maoricolpus* bottom, * PP *Neothyris* bottom, EH sandy bottom.

58 *Trochus* (*Thorista*) *viridis* Gmelin - PP *Maoricolpus* bottom.

Trochus (*Coelotrochus*) *tiaratus* Q. & G. - PP *Maoricolpus* bottom.

59 *Thoristella chathamensis* (Hutton) - PPNE, * PP *Neothyris* bottom.

Thoristella sp. - PP *Maoricolpus* bottom, * PP *Neothyris* bottom, EH sandy bottom.

60 *Maurea tigris* (Gmelin) - Craypot 64 m off Big South Cape Id.

61 *Maurea pellucida* (Val.) - PP *Neothyris* bottom.

65 * *Antisolarium egenum* (Gould) - PP *Neothyris* bottom.

Turbinidae

66 *Turbo* (*Turbo*) *smaragdus* Gmelin - PPNE.

Turbo (*Modelia*) *granosus* (Martyn) - PP *Maoricolpus* bottom, PP *Neothyris* bottom, EH sandy bottom.

Astraea heliotropium (Martyn) - PP mixed bottoms, PP *Neothyris* bottom, bryozoa shelf.

67 * *Homalopoma* (*Argalista*) *fluctuata* (Hutton) - PP *Neothyris* bottom (type locality Foveaux Strait).

* *Homalopoma* (*Argalista*) *imperforata* (Suter) - PP *Neothyris* bottom (type locality Stewart Id).

Cyclostrematidae

76 *Notosetia neozelanica* (Suter) - * PP *Neothyris* bottom, PA bryozoa bottom (type locality Stewart Id).

77 * *Brookula* sp. - PP *Neothyris* bottom.

78 *Liotella polypleura* (Hedley) - PPNE, PA bryozoa bottom.

79 *Zalipais lissa* (Suter) - EH sandy bottom.

Littorinidae

87 *Littorina* (*Austrolittorina*) *cincta* Q. & G. - PPNA, PPNE, EI.

Littorina (*Austrolittorina*) *unifasciata antipodum* Philippi - PPNE.

88 *Risellopsis varia* (Hutton) - PPNA, PPNE.

Eatoniellidae

90 *Eatoniella* (*Albosabula*) *poutama* (Smith) - PPNE, EH sandy bottom (type locality Stewart Id).

Eatoniella (*Albosabula*) *rakiura* Ponder - PPNE (type locality Stewart Id).

91 * *Eatoniella* (*Dardaniopsis*) *notalabia* Ponder - PP *Neothyris* bottom.

92 *Eatoniella* (*Dardaniopsis*) *varicolor* Ponder - PA bryozoa bottom.

Eatoniella (*Dardanula*) *limbata* (Hutton) - PA bryozoa bottom.

93 *Eatoniella* (*Dardanula*) *roseola* (Iredale) - * PP *Neothyris* bottom, PA bryozoa bottom (type locality Stewart Id).

Eatoniella (*Dardanula*) *smithi* Ponder - PPNA, PPNE, PP *Maoricolpus* bottom, EH sandy bottom, PA bryozoa bottom (type locality Stewart Id).

* *Eatoniella* spp. - PP *Neothyris* bottom.

94 *Skenella pfefferi* Suter - PA bryozoa bottom.

Rissoidae

95 *Rissoa* (*Haurakia*) *infecta* Suter -PA bryozoa bottom (type locality Stewart Id).

99 * *Powellisetia gradata* (Suter) or *P. retusa* (Powell) - PP *Neothyris* bottom.

* *Powellisetia porcellana* (Suter) - PP *Neothyris* bottom.

Powellisetia subtenuis (Powell) - PA bryozoa bottom.

103 *Estea* (*Estea*) *subfusca subfusca* (Hutton) - PPNA, PPNE, EI, PP *Maoricolpus* bottom, EH sandy bottom, PA bryozoa bottom (type locality Stewart Id).

104 *Notoscrobs* (*Microfossa*) *semen* (Odhner) - PPNE.

105 *Scrobs hedleyi* (Suter) - PPNE.

106 *Rissoina chathamensis* (Hutton) - PPNE.

108 *Merelina* (*Merelina*) *harrisonae* Powell - PPNE, EI, PP *Maoricolpus* bottom, EH sandy bottom, PA bryozoa bottom (type locality Stewart Id).

112 *Subonoba* (*Subonoba*) *foveauxiana* (Suter) - PPNE, PP *Maoricolpus* bottom, EH sandy bottom (type locality Foveaux Strait).

Subonoba (*Subonoba*) *fumata* (Suter) - EH sandy bottom.

Subonoba (*Subonoba*) *insculpta* (Murdoch) - PPNA, PPNE (type locality probably Foveaux Strait).

* *Subonoba* sp. - PP *Neothyris* bottom.

Cingulopsidae

116 *Eatonina* (*Saginofusca*) *atomaria* (Powell) - PA bryozoa bottom.

117 *Rufodardanula* (*Tubbreva*) *exaltata exaltata* (Powell) - PA bryozoa bottom.

Rissoellidae

119 *Rissoella* (*Rissoella*) *elongatospira* Ponder - PPNE, PA bryozoa bottom.

120 *Rissoella* (*Jeffreysiella*) *rissoaformis* (Powell) - PP *Maoricolpus* bottom, * PP *Neothyris* bottom, PA bryozoa bottom (type locality Stewart Id).

Rissoella (*Zelaxitas*) *cystophora* (Finlay) - PPNE, PA bryozoa bottom.

Turritellidae

125 *Maoricolpus roseus roseus* (Q. & G.) - PPNE, PP *Maoricolpus* bottom, PP *Neothyris* bottom, EH sandy bottom, PA bryozoa bottom.

127 *Zeacolpus* (*Stiracolpus*) *symmetricus* (Hutton) - PP *Neothyris* bottom, PA bryozoa bottom (type locality Stewart Id).

Caecidae

128 *Caecum digitulum* Hedley - PPNE.

Cerithiopsidae

136 * *Seila* (*Notoseila*) *terebelloides* (Martens) - PP *Neothyris* bottom (type locality Stewart Id).

Aclidae

137 * *Brookesena neozelanica* (Suter) - PP *Neothyris* bottom.

* *Larochella alta* Powell - PP *Neothyris* bottom.

Struthiolariidae

142 *Struthiolaria* (*Struthiolaria*) *papulosa* (Martyn) - PA, PP *Maoricolpus* bottom, PP *Neothyris* bottom.

143 * *Struthiolaria* (*Pelicaria*) *vermis* (Martyn) - PP *Neothyris* bottom.

Capulidae

146 *Neojanacus perplexus* Suter - PP *Maoricolpus* bottom.

Trichotropidae

147 * *Trichosirius inornatus* (Hutton) - PP *Neothyris* bottom.

Calyptraeidae

149 *Zegalerus tenuis* (Gray) - PP *Maoricolpus* bottom.

Maoricrypta (*Zeacrypta*) *monoxyla* (Lesson) - PPNA, PP *Maoricolpus* bottom, PP *Neothyris* bottom, bryozoa shelf.

Lamellariidae

150 * *Lamellaria ophione* Gray - PP *Neothyris* bottom.

Naticidae

156 *Uberella vitrea* (Hutton) - * PP *Neothyris* bottom, EH sandy bottom (type locality Stewart Id).

Cassidae

159 *Xenophalium pyrum* (Lamark) - PP *Neothyris* bottom.

Cymatiidae

164 *Cabestana spengleri* (Perry) - PP *Neothyris* bottom.

166 *Argobuccinum tumidum* (Dunker) - PP *Neothyris* bottom, EH sandy bottom.

Muricidae

170 *Poirieria zelandica* (Q. & G.) - PP *Neothyris* bottom.

173 *Xymene plebeius* (Hutton) - PP *Maoricolpus* bottom.

174 *Xymene ambiguus* (Philippi) - PPNA.

175 *Xymene aucklandicus* (E.A. Smith) - PPNA, PPNE.

176 *Xymene pumilus* (Suter) - PPNA, PP *Maoricolpus* bottom, PP *Neothyris* bottom (type locality Stewart Id).

Xymene sp. - EH sandy bottom, PA bryozoa bottom.

Comptella curta (Murdoch) - EI (type locality probably Stewart Id).

* *Comptella* sp. - PP *Neothyris* bottom.

180 *Lepsithais lacunosus* (Brugière) - PPNA, PPNE, PPDC, PPEC, EI.

Columbellidae

183 *Paxula paxillus* (Murdoch) - PPNE, PP *Maoricolpus* bottom, EH sandy bottom (type locality probably Stewart Id).

184 *Paxula transitans* (Murdoch) both the finely sculptured *transitans* form and the coarsely sculptured *murdochi* form - PPNA, PPNE, EI (type locality of both *transitans* and *murdochi* probably Stewart Id).

Paxula sp. - PPNE.

187 *Zemitrella sulcata sulcata* (Hutton) - PP *Maoricolpus* bottom (type locality Stewart Id).

Zemitrella sp. - PPNE, PP *Maoricolpus* bottom, * PP *Neothyris* bottom, EH sandy bottom.

Buccinidae

194 *Cominella* (*Eucominia*) *nassoides nassoides* (Reeve) - PPNA, PP mixed bottoms, PP *Neothyris* bottom, EH sandy bottom.

195 *Cominella* (*Eucominia*) *otagoensis* (Finlay) - PP *Neothyris* bottom, EH sandy bottom.

197 *Austrofusus glans* (Röding) - PP *Neothyris* bottom.

198 *Buccinulum pertinax pertinax* (Martens) - PPNA, PPNE, PA, PP *Neothyris* bottom.

199 *Buccinulum vittatum littorinoides* (Reeve) - PPNA, PPNE, PPDC, PPEC, EI, PA.

200 * *Euthrenopsis* sp. - PP *Neothyris* bottom.

Volutidae

211 *Alcithoe* (*Alcithoe*) *arabica* (Gmelin) - PA.

Alcithoe sp. - PP *Maoricolpus* bottom.

Volutomitridae

215 *Microvoluta marginata* (Hutton) - PP *Neothyris* bottom.

Mitridae

216 *Austromitra rubiginosa* (Hutton) - PP *Maoricolpus* bottom, EH sandy bottom.

Marginellidae

223 *Marginella* (*Volvarinella*) *lurida* Suter - EH sandy bottom (type locality Foveaux Strait).

Marginella (*Volvarinella*) *stewartiana* Suter - PP *Maoricolpus* bottom, EH sandy bottom (type locality Port Pegasus).

Turridae

228 * *Taranis nexilis* (Hutton) - PP *Neothyris* bottom.

229 *Comitas trailli* (Hutton) - PP *Neothyris* bottom (type locality Stewart Id).

233 *Splendrillia* (*Splendrillia*) *otagoensis* Powell - PP *Neothyris* bottom.

238 *Neoguraleus sinclairi* (Gillies) - PP *Maoricolpus* bottom, EH sandy bottom.

Neoguraleus sp. - PP *Maoricolpus* bottom, * PP *Neothyris* bottom, EH sandy bottom.

241 *Liracraea* sp. - PP *Neothyris* bottom.

Architectonicidae

248 ?*Zerotula* sp. - EH sandy bottom.

Pyramidellidae

256 *Turbonilla* (*Chemnitzia*) sp. - PPNE, PP *Maoricolpus* bottom, PP mixed bottoms, * PP *Neothyris* bottom.

262 *Odostomia* sp. - PPNE, * PP *Neothyris* bottom, PA bryozoa bottom.

265 *Agatha georgiana* (Hutton) - * PP *Neothyris* bottom, EH sandy bottom.

Evalea liricincta (Suter) - PPNA, EH sandy bottom (type locality Port Pegasus).

Linopyrga rugata rugata (Hutton) - PPNE, PP *Maoricolpus* bottom, * PP *Neothyris* bottom, EH sandy bottom.

Scaphandridae

271 * *Cylichna* sp. - PP *Neothyris* bottom.

Philinidae

272 *Philine auriformis* Suter - PP *Maoricolpus* bottom.

* *Philine powelli* Rudman - PP *Neothyris* bottom.

Aglajidae

272 *Aglaja* (*Melanochlamys*) *cylindrica* (Cheeseman) - PP *Maoricolpus* bottom.

Retusidae

277 *Cylichnina striata* (Hutton) - EH sandy bottom, PA bryozoa bottom.

Trimusculidae

291 *Gadinalea conica* (Angas) - PPNE, EI.

Siphonariidae

292 *Siphonaria zelandica* Q. & G. - PPNA, PA.

Siphonaria cookiana Suter - PPNA.

Ellobiidae

294 *Marinula filholi* Hutton - PPNA.

295 *Marinula striata* Odhner - PPNE.

Leuconopsis obsoleta (Hutton) - PPNA, PPNE, EI.

Rotadiscidae [Endodontidae in Powell 1979]

306 *Rotadiscus* [*Charopa* in Powell, 1979] *smithae* (Dell) - EH sandy bottom (type locality Stewart Id; this is a land snail that had been washed down into Easy Harbour).

SCAPHOPODA

Dentaliidae

354 *Dentalium* (*Antalis*) *suteri* Emerson - PP *Neothyris* bottom (type locality Port Pegasus).

Dentalium (*Fissidentalium*) *zelandicum* Sowerby - PP *Neothyris* bottom.

Siphonodentaliidae

354 * *Cadulus teliger* Finlay - PP *Neothyris* bottom.

BIVALVIA

Nuculidae

355 *Nucula* (*Nucula*) *dunedinensis* Finlay - PPNE, * PP *Neothyris* bottom, EH sandy bottom.

356 *Nucula* (*Nucula*) *nitidula* A. Adams - PPNE, * PP *Neothyris* bottom, EH sandy bottom.

Nucula (*Linucula*) spp. - PP *Maoricolpus* bottom.

Nucula sp. - PP mixed bottoms.

Nuculanidae

359 *Sacella bellula* (A. Adams) - PP *Maoricolpus* bottom, PP mixed bottoms, PP *Neothyris* bottom.

Manzanellidae

362 *Nucinella maoriana* (Hedley) - PP *Maoricolpus* bottom, PP mixed bottoms, * PP *Neothyris* bottom.

Malletiidae

362 *Neilo australis* (Q. & G.) - PP *Maoricolpus* bottom, PP *Neothyris* bottom.

Solemyidae

363 *Solemya parkinsoni* E.A. Smith - PP mixed bottoms, * PP *Neothyris* bottom, EH sandy bottom.

Arcidae

364 *Barbatia novaezealandiae* (E.A. Smith) - PP mixed bottoms.

Philobryidae

367 *Philobrya melcagrina* (Bernard) - PPNE (type locality Stewart Id).

* *Philobrya* sp. - PP *Neothyris* bottom.

369 *Lissarca stewartiana* Powell - * PP *Neothyris* bottom, PA bryozoa bottom (type locality Stewart Id).

370 *Cosa costata* (Bernard) - EH sandy bottom (type locality Stewart Id).

* *Cosa filholi* (Bernard) - PP *Neothyris* bottom (type locality Stewart Id).

371 *Verticipronus mytilus* Hedley - * PP *Neothyris* bottom, EH sandy bottom.

Mytilidae

372 *Mytilus edulis aoteanus* Powell - PPNA, PPDC.

Aulacomya ater maoriana (Iredale) - PPNA, PA (type locality Stewart Id).

373 *Xenostrobus securis* (Lamark) - PPNA.

374 *Modiolarca impacta* (Hermann) - PPNA, PP *Neothyris* bottom.

Ostreidae

375 *Ostrea lutaria* Hutton - PPNA, PP mixed bottoms, PP *Neothyris* bottom.

Pectinidae

377 *Pecten novaezelandiae* Reeve - PP mixed bottoms, PP *Neothyris* bottom.

Mesopeplum convexum (Q. & G.) - PP *Neothyris* bottom.

378 *Chlamys dieffenbachi* (Reeve) - PP mixed bottoms, PP *Neothyris* bottom.

. *Chlamys gemmulata* (Reeve) - PP *Maoricolpus* bottom, PP mixed bottoms, PP *Neothyris* bottom.

Limidae

382 * *Limatula suteri* (Dall) - PP *Neothyris* bottom (type locality Port Pegasus).

Anomiidae

383 *Monia zelandica* (Gray) - PP mixed bottoms, PP *Neothyris* bottom, bryozoa shelf.

Thyasiridae

386 *Thyasira* (*Thyasira*) *peroniana peregrina* (Iredale) - PP *Maoricolpus* bottom, PP mixed bottoms, PP *Neothyris* bottom (type locality Stewart Id).

387 *Maorithyas marama* Fleming - PP *Maoricolpus* bottom, * PP *Neothyris* bottom,

Ungulinidae

388 *Diplodonta* (*Zemysina*) *globus* (Finlay) - PP *Maoricolpus* bottom, PP mixed bottoms, PP *Neothyris* bottom, EH sandy bottom (type locality Stewart Id).

Erycinidae

389 *Melliteryx parva* (Deshayes) - PP *Maoricolpus* bottom, EH sandy bottom.

Lasaea rubra hinemoa Finlay - PPNA, PPNE, PP *Maoricolpus* bottom, EH sandy bottom.

390 *Borniola decapitata* (Powell) - PPNE, EI, PP *Maoricolpus* bottom (type locality Port Pegasus).

391 *Arthritica bifurca* (Webster) - PP *Maoricolpus* bottom, PP mixed bottoms, * PP *Neothyris* bottom.

Kelliidae

393 *Kellia* (*Kellia*) *cycladiformis* (Deshayes) - PP *Neothyris* bottom.

Montacutidae

397 *Mysella unidentata* (Odhner) - PPNE, PP *Maoricolpus* bottom, * PP *Neothyris* bottom, EH sandy bottom (type locality Stewart Id).

**Mysella* sp. - PP *Neothyris* bottom.

Galeommatidae

398 *Scintillona zelandica* (Odhner) - PP *Maoricolpus* bottom, PP mixed bottoms.

Cyamiidae

399 *Cyamium* (*Cyamiomactra*) *problematicum* (Bernard) - PP *Maoricolpus* bottom, EH sandy bottom (type locality Stewart Id).

401 *Kidderia* (*Costokidderia*) *costata* Odhner - * PP *Neothyris* bottom, EH sandy bottom.

402 **Perrierina* (*Perrierina*) *subquadrangula* Dell - PP *Neothyris* bottom.

Perrierina (*Perrierina*) *taxodonta* Bernard - PA bryozoa bottom (type locality Stewart Id).

Neoleptonidae

403 *Neolepton antipodum* (Filhol) - PPNE, EI, PP *Maoricolpus* bottom, * PP *Neothyris* bottom, EH sandy bottom, PA bryozoa bottom.

Sportellidae

405 **Anisodonta* (*Tahunanuia*) alata (Powell) - PP *Neothyris* bottom.

Carditidae

406 *Cardita aoteana* Finlay - PP *Neothyris* bottom.

407 *Venericardia purpurata* (Deshayes) - PP *Neothyris* bottom.

408 *Pleuromeris zelandica* (Deshayes) - PP *Neothyris* bottom.

Condylocardiidae

408 *Condylocardia crassicosta* Bernard - EH sandy bottom (type locality Stewart Id).

Condylocuna concentrica (Bernard) - EH sandy bottom (type locality Stewart Id).

Crassatellidae

411 *Cuna* (*Volupicuna*) *laqueus* Finlay - EH sandy bottom.

Cardiidae

413 *Nemocardium* (*Pratulum*) *pulchellum* (Gray) - PP *Neothyris* bottom.

Mactridae

414 *Longimactra elongata* (Q. & G.) - bryozoa shelf.

Scalpomactra scalpellum (Reeve) - PP *Neothyris* bottom, EH sandy bottom.

Mesodesmatidae

415 *Paphies australis* (Gmelin) - PPNA, PPDC, PA.

Tellinidae

417 *Tellina* (*Tellinella*) *charlottae* E.A. Smith - PP *Maoricolpus* bottom.

Tellina (*Tellinella*) *huttoni* E.A. Smith - PP *Maoricolpus* bottom, PP mixed bottoms.

Tellina (*Macomona*) *liliana* Iredale - PP *Maoricolpus* bottom.

Psammobiidae

418 *Gari lineolata* (Gray) - PA, EH sandy bottom.

Gari stangeri (Gray) - PP *Neothyris* bottom, EH sandy bottom.

Soletellina nitida (Gray) - PPNA. 419

* *Ascitellina urinatoria* (Suter) - PP *Neothyris* bottom.

Semelidae

420 *Leptomya retiaria retiaria* (Hutton) - PP *Maoricolpus* bottom.

Veneridae

423 *Dosinia* (*Kereia*) *greyi* Zittel - PP *Neothyris* bottom.

424 *Tawera spissa* (Deshayes) - PPNA, PP *Maoricolpus* bottom, PP *Neothyris* bottom, EH sandy bottom.

Plurigens phenax Finlay - bryozoa shelf.

425 *Notocallista* (*Striacallista*) *multistriata* (Sowerby) - PP *Maoricolpus* bottom, PP mixed bottoms, PP *Neothyris* bottom.

426 *Venerupis* (*Paphirus*) *largillierti* (Philippi) - PPNA, PPNE, PPEC, PA, PP *Maoricolpus* bottom, PP *Neothyris* bottom.

Chione (*Austrovenus*) *stutchburyi* (Wood) - PPNA, PPDC, PPEC, PA, PP *Maoricolpus* bottom.

427 *Dosina zelandica zelandica* Gray - PP *Neothyris* bottom.

Hiatellidae

428 *Hiatella arctica* (Linnaeus) - PP *Neothyris* bottom.

429 *Panopea smithae* Powell - bryozoa shelf.

Myochamidae

432 *Myadora antipodum* E.A. Smith - * PP *Neothyris* bottom, EH sandy bottom.

433 *Myadora subrostrata* E.A. Smith - PP *Neothyris* bottom, EH sandy bottom.

Myadora sp. - EH sandy bottom.

Thraciidae

433 *Thracia* (*Hunkydora*) *australica novozelandica* (Reeve) - PP *Neothyris* bottom, EH sandy bottom, bryozoa shelf.

434 **Parvithracia suteri* Finlay - PP *Neothyris* bottom (type locality Port Pegasus).

Verticordiidae

435 **Haliris* (*Setaliris*) *setosa* (Hedley) - PP *Neothyris* bottom.

Cuspidariidae

437 **Cuspidaria trailli* (Hutton) - PP *Neothyris* bottom.

Cuspidaria willetti Fleming - PP *Maoricolpus* bottom.

438 **Austroneaera brevirostris* Powell - PP *Neothyris* bottom.

THE BRACHIOPOD CHECKLIST

The brachiopod checklist is based on Elliot Dawson's 1993 checking of the brachiopods sorted from the 1972 expedition's collections and originally identified and incorporated into the Museum's collections by Frank Climo and Dr Richard Dell. They are listed here in the order used by Dawson in his 1990 and 1992 lists of living New Zealand brachiopods. To aid recognition of the 5 species involved the colour notations as used by Joyce Richardson in her 1979 *Cookia* article on Stewart Island brachiopods are also given here. Abbreviations for the shore collections and bottom types are as used for the mollusc checklist. Page numbers given in the left hand column refer to pages in Dawson (1992) where the species named are listed with all significant bibliographic references.

Brachiopoda taken by the Dominion Museum 1972 southern Stewart Island expedition:

ARTICULATA

Hemithyrididae

13 *Notosaria nigricans* (Sowerby) - PP mixed bottoms, PP *Neothyris* bottom (ribbed black).

Terebratulidae

17 *Liothyrella neozelanica* Thomson - PP mixed bottoms, PP *Neothyris* bottom (large white).

Terebratellidae

23 *Terebratella sanguinea* (Leach) - PP mixed bottoms, PP *Neothyris* bottom (ribbed red).

25 *Waltonia inconspicua* (Sowerby) - PPNE, EI, PP mixed bottoms, PP *Neothyris* bottom (smooth red).

28 *Neothyris lenticularis* (Deshayes) - PP mixed bottoms, PP *Neothyris* bottom (large pink; type locality Foveaux Strait).

NOTES ON STEWART ISLAND MOLLUSCS, BRACHIOPODS AND BIOGEOGRAPHY

The nearest approach we have to a checklist of Stewart Island molluscs is Powell's 1939 list of "The Mollusca of Stewart Island", which include 383 species, supplemented and updated by a series of 6 papers by Elsie Smith of Halfmoon Bay, Stewart Island (1952, 1953, 1957, 1961a, 1961b, 1962). Smith added about 114 species to Powell's 1939 list, 6 of which were new species described by Smith herself. The only, relatively easy way to get a more modern mollusc checklist for Stewart Island would be to go through Powell's 1979 *New Zealand Mollusca* species by species noting the Stewart Island and/or Forsterian molluscan provincial records.

Richard Willan in his contribution to the collected papers on "Recent brachiopods from New Zealand" (1981) compiled by Joyce Richardson, gives an account of soft-bottom assemblages in Paterson Inlet. Willan describes two associations in this relatively shallow (15-25 m) northeastern Stewart Island harbour. In his sand-dwelling assemblage near the entrance to Paterson Inlet, the characteristic molluscs include *Maoricolpus*, *Pecten*, *Atrina*, *Tawera*, *Scalpomactra*, and the brachiopods *Neothyris*, *Waltonia*, *Terebratella*. In his mud assemblage within the central areas of Paterson Inlet, the characteristic molluscs include *Maoricolpus*, *Nucula*, *Pecten*, *Chlamys gemmulata*, and the same three brachiopods *Neothyris*, *Waltonia* and *Terebratella*. In all, Willan lists 100 mollusc species from the 1977 and 1979 collections he studied from Paterson Inlet.

There was nothing similar in Paterson Inlet to the dead *Neothyris*/live *Astraea*, 5 brachiopod, muddy bottom described in the present account from about 29-50 m in Port Pegasus, southern Stewart Island. *Astraea heliotropium* is present in both of Willan's associations in Paterson Inlet but is not regarded as a "characteristic" species of either. Paterson Inlet is much bigger at 65 sq. km than Port Pegasus, but is distinctly shallower over most of its area than Port Pegasus. Paterson Inlet has a 4 brachiopod bottom with *Neothyris*, *Waltonia*, *Terebratella* and *Notosaria*, the latter present but not listed as "characteristic" by Willan. *Liothyrella* is not recorded by Willan (1981) from the NZ Oceanographic Institute's 1977 and 1979 Paterson Inlet cruises, which form the basis of the Stewart Island section of Richardson's 1981 collected studies on "Recent brachiopods from New Zealand".

In addition to Jenny Raven's 1992 article in *Cookia* about shell collecting at Port Pegasus mentioned in the preamble to this present account, the only other article to appear in *Cookia* on collecting shells at Stewart Island is a short note by Meg Taylor in 1989 giving a list of species taken at Horseshoe Bay, just north of Halfmoon Bay at the northern entrance to Paterson Inlet.

In 1937, R.S. Allan of Canterbury University described some dredging done on his behalf in Port Pegasus by Edgar Stead the previous year. Stead working in 31-36 m found the "dominant organisms" were in Allan's terminology the brachiopod *Neothyris lenticularis*, the pectinid *Chlamys radiatus*, the mytilid *Musculus impactus* and a series of tunicates. From these we recognise the Port Pegasus *Neothyris* bottom described above, as Allan's *Chlamys radiatus* is the large Stewart Island form of *C. gemmulata* in Powell (1979, p.378), and Allan's *Musculus impactus* is *Modiolarca impacta* with its characteristic byssus thread nests in Powell (1979, p.374). Certainly many of the Port Pegasus *C. gemmulata* were large and purple forming what Willan (1981, p.242) describes as the predominant purple morph of the Stewart Island population of *C. gemmulata* form *suteri*. *Chlamys gemmulata*, as Powell and Willan point out, shows a clinal increase in size with latitude, with Fiordland and Stewart Island populations being much larger than their northern counterparts. Allan's listing of *M. impacta* as a dominant suggests that Stead's dredging might have been in the South Arm of Port Pegasus (compare our BS 285 with 281 and 283 described above) but not enough work has been done in Port Pegasus yet to indicate that *M. impacta* is a dominant member of the PP *Neothyris* bottom in the somewhat shallower South Arm but not so in the North Arm. It is interesting that Allan did not mention the presence of *Astraea* in Stead's dredgings.

Allan, being a brachiopod specialist, was particularly interested in Stead's observation that adult *Neothyris* were lying loose on the bottom of Port Pegasus with "the pedicle apparently having atrophied" (1939, p.160) and that juveniles of *Neothyris*, as well as immature specimens of *Terebratella sanguinea*, were attached by their pedicles to adult *Chlamys*. Allan went on to theorise that as adults pectens were mobile this could be a hitherto unrecognised "factor in brachiopod migration". We need not go into Allan's speculations here on brachiopod/pectinid Cenozoic migrations except to note that he regarded the *Neothyris*/*Chlamys* association as a "typical cold-water community now restricted to the Fosterian Province" (p.160) that in Castlecliffian (late Pleistocene) times reached as far north as the Upper Castlecliffian strata on the Wanganui coast (p.163).

Joyce Richardson, as mentioned in the preamble to this article, referred in her 1979 *Cookia* article on the "Brachiopods of Stewart Island" to the 5 brachiopod bottom in Port Pegasus revealed by the 1972 Dominion Museum expedition. She reported that many of the living brachiopod species found in New Zealand waters "may occur together in Stewart Island, one famous dredge haul from Port Pegasus (by *Acheron* during the National Museum Expedition of 1971) containing five species". The Dominion Museum had become the National Museum by the time Joyce wrote this article but the expedition's date was 1972. The stations referred to were BS 283 and 284 which Joyce had been examining with John Yaldwyn at that time. Richard Willan had also been briefed on our 1972 expedition results and recorded (1981, p.238) that the brachiopods *Terebratella sanguinea* and *Waltonia inconspicua* were both "invariably attached to *Astraea heliotropium*" on the Port Pegasus muddy bottom and that *Neothyris lenticularis* was "exceedingly common in Port Pegasus, and the National Museum stations revealed vast areas where its dead shells carpet the bottom in a single layer" - referring to BS 281, 283 and 285. The "single layer" comment is based on our observations that all large dead *Neothyris* had been lying in the "in life" position with external growths on the exposed portion of the paired valves but were clean on the buried portion of the valves (Joyce Richardson gives a clear diagram of the in life position of *N. lenticularis* in her *Scientific American* account of brachiopod adaptations, 1986, p.102). We had also observed that the muddy bottom substrate at these stations did not contain many fragments of disintegrating *Neothyris* valves. Note Richardson and Willan use the

generic name *Terebratella* for both *Waltonia inconspicua* (as used in the present article) and for *T. sanguinea.*

Croizat (1958, pp.755, 800, 866, 874, 878 and figs. 241-243) referring to several groups of birds, plants, gekkos and marine shells discusses Stewart Island in the context of southwestern Pacific biogeography. A lead into ongoing work on southwestern Pacific biogeography is to be found in *New Zealand Journal of Zoology* 16(4) published in 19909 and now a standard reference for students reading biogeography at Victoria University of Wellington. Heads's (1990) paper in that volume provides information on the biogeography of New Zealand brachiopods for example. Paulin and Roberts (1992) give distribution maps for all the shoreline fish they mention. These maps, particularly when viewed alongside maps in Heads's 1990 paper, provide basic information on many aspects of the biogeography of Stewart Island.

From the molluscan point of view Powell (1939, p.211) found that the "fauna of Stewart Island for its latitude (47° S) is a particularly rich one, very noticeable features being the large size and brilliant colouring of many of its species. This applies equally well to [molluscan] species that are generally distributed in New Zealand, and also to the echinoid *Evechinus chloroticus* --- The bright colouring of specimens generally is no doubt due to the exceptional clarity of the water, for the dredge could be seen quite plainly on one occasion while being dragged at a depth of eight fathoms. Two external influences affect the fauna - the cold water west wind drift and to a lesser extent the East Australian warm water current". Adams, Cowan, Norris and Willa in their checklist of Stewart Island algae (1974) summarised the biogeographic background in this straight forward and simple way "the Island's marine environment is strongly influenced by the Southland Current, that --- originates southwest of Stewart Island and consists of water from the Subtropical Convergence region with some admixture of Australian Subantarctic water".

EPILOGUE

It has been a long time since the Dominion Museum's southern Stewart Island expedition in 1972, the Museum has had two name changes in these last 20 years, but the basic information we obtained on the molluscs and brachiopods of the Port Pegasus area had not advanced in those 20 years beyond Frank Climo's lists in the *Wellington Shell Club Bulletin* of 1972, and Joyce Richardson's list in *Cookia* in 1979. Now at last we have provided the background to the expedition, its personnel, its objectives and a summary of its results. We have also given a reasonably comprehensive account of the marine biological work done, and the shore and bottom types found in Port Pegasus and some nearby southern Stewart Island areas. We have provided a full checklist of the molluscs identified by Frank Climo and Bruce Marshall in 1972 and 1975 set out in Powell's established 1979 order and nomenclature, and a list of the brachiopods found set out in Elliot Dawson's 1990/1992 order and nomenclature.

The marine algae are all listed by Nancy Adams in her 1974 checklist of Stewart Island algae written with her co-workers Cowan, Norris and Willa. Many other marine groups taken during the 1972 expedition are available in the collections of the Museum of New Zealand Te Papa Tongarewa, some such as the echinoderms and decapod crustaceans identified and integrated in the collections in systematic order, but many others such as sponges, coelenterates, polychaete worms, amphipods, isopods, bryozoans and ascidians, for example, waiting in bulk collections for specialists to examine, identify and publish. These tasks are for others, with other skills, for the present your two authors feel they have provided you with their share of the information gathered on marine life in Port Pegasus and some nearby southern Stewart Island localities during the Museum's 1972 expedition in R.V. *Acheron.* We regret that our scientific colleagues Bruce Hamlin and Sir Charles Fleming did not live to share our satisfaction in making this part of the information we all gathered available to a wider audience.

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